

**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR PERMITS PROGRAM**

TECHNICAL ANALYSIS REPORT
For Air Quality Control Minor Permit No. AQ0230MSS01
Project X-256

Trident Seafoods Corporation
St. Paul Plant

TITLE I PERMIT REVISION 2005

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Date: Final – August 10, 2005

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ABBREVIATIONS/ACRONYMS

AAC	Alaska Administrative Code
ACMP	Alaska Coastal Management Program
ADEC	Alaska Department of Environmental Conservation
AS	Alaska Statutes
ASTM	American Society of Testing and Materials
CEMS	Continuous Emission Monitoring System
C.F.R.	Code of Federal Regulations
EPA	Environmental Protection Agency
MACT	Maximum Achievable Control Technology
NA	Not Applicable
NAICS	North American Industry Classification System
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NSPS	New Source Performance Standards
ORL	Owner Requested Limit
PS	Performance specification
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
RM	Reference Method
SIC	Standard Industrial Classification
SN	Serial Number
TBD	To Be Determined

Units and Measures

bhp	brake horsepower or boiler horsepower ¹
gr./dscf	grains per dry standard cubic feet (1 pound = 7,000 grains)
dscf	dry standard cubic foot
gph	gallons per hour
kW	kiloWatts
kW-e	kilowatts electric ²
lbs	pounds
mmBtu	million British Thermal Units
ppm	parts per million
ppmv	parts per million by volume
tph	tons per hour
tpy	tons per year
wt%	weight percent

Pollutants

CO	Carbon Monoxide
HAPS	Hazardous Air Pollutants
H ₂ S	Hydrogen Sulfide
NO _x	Oxides of Nitrogen
NO ₂	Nitrogen Dioxide
NO	Nitric Oxide
PM-10	Particulate Matter with an aerodynamic diameter less than 10 microns
SO ₂	Sulfur Dioxide
VOC	Volatile Organic Compound

¹ For boilers: One boiler horsepower = 33,472 Btu-fuel per horsepower-hour divided by the boiler's efficiency.
For engines: approximately 7,000 Btu-fuel per brake horsepower-hour is required for an average diesel internal combustion engine.

² kW-e refers to rated generator electrical output rather than engine output

1.0 Introduction

Trident Seafoods Corporation (Trident) submitted an application dated March 30, 2005 to the Alaska Department of Environmental Conservation (the department), requesting a minor permit under 18 AAC 50.508(6), to revise or rescind terms and conditions of a Title I permit issued under 18 AAC 50 for the St. Paul Plant. Trident submitted supplemental application material on May 26, 2005 and June 22, 2005.

1.1 Stationary Source Description

The St Paul Plant is a land-based seafood processing plant on St. Paul Island. The plant includes five diesel fuel-fired engines and two diesel fuel-fired boilers.

1.2 Description of Application

In their original application dated March 2005, Trident requested that the department replace Construction Permit No. 9825-AC014 with a minor permit, and revise some of the terms and conditions in the construction permit. Trident requested that the minor permit replace the annual fuel limits of the construction permit with emissions limits shown in Table 1 of the application (i.e. 60.5 tpy of NO_x, 20.4 tpy of SO₂, 2.1 tpy of PM-10, 9.3 tpy of CO, and 1.0 tpy of VOC). They further requested that the department revise the construction permit to:

- eliminate NSPS, Subpart Dc requirements;
- replace fuel limits with annual NO_x emission limits;
- eliminate further source testing requirements;
- remove completed requirements regarding stack diameters and fuel flow meters;
- establish fish oil as fuel for boilers (Emission Units 6 and 7); and
- eliminate stationary source operating reports and annual compliance certification.

In a letter dated May 26, 2005, Trident requested that the department process the minor permit application as an Owner-Requested-Limit (ORL) under 18 AAC 50.225.

In an amendment dated June 22, 2005, Trident rescinded their requests for annual emission limits on SO₂, PM-10, CO, and VOC (they retained the annual NO_x stationary source wide limit of 60.5 tpy). They also requested that NO_x emission reallocation (i.e., no more than 45.0 tpy NO_x in Units 1 and 2, no more than 57.6 tpy NO_x in Emission Unit 1 through 5, and no more than 2.9 tpy NO_x in Units 6 and 7) authorized in Construction and Operating Permit No. 231TVP01 be reinstated. The department has listed its findings regarding the application in Section 1.5.

1.3 Permit History

The St. Paul Plant is currently operating under Construction Permit No. 9825-AC014, issued January 25, 1999. (As indicated in 18 AAC 50.320(b), effective at the time Construction Permit No. 9825-AC014 was issued, “The terms and conditions of a construction permit remain effective until modified or revoked by the department, regardless of any change in ownership of the [stationary source] or [emission units] at the [stationary source]....”

Title V Construction and Operating Permit No. 230TVP01 expired in March 2005. Trident did not renew the permit because with the emissions limits in Construction Permit No. 9825-AC014, this stationary source emits less than 100 tpy of any regulated air pollutant. Therefore, it is not

subject to Title V permitting requirements under the department regulation effective October 1, 2004. However, all of the construction permit authorizations in Title V Construction and Operating Permit No. 230TVP01 expired as well.

For a detailed chronological history of the development of Construction/Operating Permit No. 220TVP01, see Attachment A.

1.4 Emissions Summary

The department calculated PTE, shown in **Table 1**, for this modification based on the application as amended through June 22, 2005, as follows:

- NO_x emissions are capped at 57.6 for Units 1 through 5 (also 45.0 for Units 1 and 2), and 2.9 tpy for Units 6 and 7. Trident provided engine NO_x emission factor of 0.268 lb/gal (2002 source test) and boiler NO_x emission factor of 0.20 lb/gal (AP-42) in the application. Using these emission factors and maximum fuel consumption for each unit (also in the application), results in estimated maximum fuel usage of about 335,821 gallons per year (gal/year) for Units 1 and 2, about 429,851 gal/year for Units 1 through 5, and about 288,576 gal/year for Units 6 and 7. (The fuel use is an estimate only, not a limit. The department used the fuel estimates to calculate the potential emissions of CO, PM-10, VOC and SO₂.)
- Annual SO₂ emissions for all units are based on mass balance calculations, assuming a fuel sulfur of 0.5 wt % S. Highest SO₂ emissions occur when Units 1 through 5 combust their maximum estimated fuel.
- Engine PM-10, CO, and VOC emissions based on the maximum vendor emission factor for each group of units (1 and 2, 1 through 5) and the fuel use estimates discussed above. Boiler CO emission factors are based on AP-42 emission factors and fuel use estimates discussed above. Highest PM-10, CO, and VOC emissions occur when Units 1 and 2 combust their maximum estimated fuel.³

Table 1 – Stationary Source Potential to Emit

Pollutant	Emissions (tpy)			
	Before	After	Change	Threshold ^a
NO _x	60.5	60.5 (limit)	0	10
SO ₂	18.9	25.3	+6.3	10
PM-10	2.1	3.2	+1.1	10
CO	9.3	15.1	+5.8	not applicable
VOC	1.5	2.3	+0.8	not applicable
Assessable ⁴	79.4	80.9		

Table Notes:

^a Threshold for a minor permit under 18 AAC 50.502(c)(3)

³ See construction permit application dated January 9, 1998, Table 2-4 for vendor emission information.

⁴ The expired title V permit incorrectly listed assessable emissions as 75.46 tpy. This was an error carried into the permit from the Title V application dated November 28, 1997, and amended through March 25, 1998.

The assessable emissions for this stationary source after this permit modification are 81 tpy.

1.5 Department Findings

Based on a review of the application, the department finds that:

1. Trident requested a minor permit for air quality control under 18 AAC 50.508(6), to revise or rescind terms and conditions of a Title I permit issued under 18 AAC 50. The previous permit terms and condition are previous owner requested limits for Ambient Air Quality Protection (annual NO₂ increment, 3-hour and 24-hour SO₂ increment) and to avoid classification as a PSD Major stationary source for NO_x. An ORL under 18 AAC 50.225, along with rescinding existing conditions established to satisfy requirements that were in place at the time of permitting for ambient protection, are not appropriate for this permit application. This source would still require a minor permit if the department were permitting it as a new source for this permit action. (The stationary source would be classified under 18 AAC 50.502(c)(1) for NO_x and 18 AAC 50.502(c)(2) because it has an emission unit with a rated capacity greater than 10 mmBt/hr in an SO₂ special protection area.)

So that all permit requirements will be in one document, the department is rescinding Air Quality Construction Permit 9825-AC014, and is incorporating those conditions into minor permit AQ0230MSS01. Some of those conditions are revised as otherwise described in this TAR.

2. The revisions will result in emission increases of SO₂, PM-10, CO and VOC. The emission increases are below the thresholds listed in 18 AAC 50.502(c)(3) for PM-10 and SO₂ as shown in **Table 1**.
3. Trident's application and subsequent submittals for a minor permit contains the elements listed in 18 AAC 50.540(k). Under 18 AAC 50.542(f)(9), the department finds that the permit will still require the owner or operator to comply with all applicable requirements of this chapter.
4. The St. Paul Plant is located in the St. Paul Coastal District. The project is consistent with the Alaska Coastal Management Program (ACMP) through AS 46.40.040(b)(1). The department notified the local district and resource agencies of the project on May 27, 2005. The local district and resource agencies did not request additional ACMP review through 6 AAC 50.810.
5. The department will remove NSPS Subpart Dc requirements for Emission Unit 6: On November 16, 2004 the department agreed with Trident that Unit 6 is not an affected facility under NSPS Subpart Dc. EPA confirmed in a letter dated April 22, 2005 that Subpart Dc does not apply to the Johnston Boiler (Unit 6). The issue is moot for the purposes of this permit, however because the department no longer adopts NSPS requirements for the purposes of state law as they apply to stationary sources not subject to Title V.
6. The department will establish NO_x emission limits to replace the fuel limits. The department originally established the annual fuel limits for NO_x PSD avoidance and NO₂ ambient air quality protection. The change from a fuel limit to an emission limit will have no effect on NO_x PSD avoidance and ambient air requirements.

7. There is no need to eliminate requirements for further source testing as described in the application. These requirements do not exist in Permit No. 9825-AC014. The requirements in Construction/Operating Permit No. 230TVP01 went away when the permit expired.
8. The department will remove the requirement to install stack diameters and fuel flow meters but will retain requirements to operate and maintain stack diameters and fuel flow meters as limited, as described in Section 2.4.4.
9. The department authorizes the use of fish oil in the boilers as described in Section 2.4.5.
10. The department will eliminate the requirements for annual compliance certification. This is a Title V program requirement. The department has retained sufficient reporting requirements as necessary to ensure compliance with applicable requirements of this chapter, as described in Section 2.0.
11. The department will reinstate the NO_x emission reallocation (i.e. no more than 45.0 tpy NO_x in Units 1 and 2, no more than 57.6 tpy NO_x in Emission Unit 1 through 5, and no more than 2.9 tpy NO_x in Units 6 and 7) authorized in Construction and Operating Permit No. 231TVP01 (which has expired). The department found on September 30, 1999 (included in Attachment B of this TAR) that the revision to emission allocations will not result in a violation of NO₂ ambient air quality standards or increments.
12. The permit revisions requested in this minor permit application have no effect on short-term SO₂ ambient air quality protection requirements included in Construction Permit 9825-AC014.
13. Trident originally requested annual emission limits for NO_x, SO₂, PM-10, CO, and VOC in Table 1 of the application that reflect the fuel use limit in Construction Permit No. 9825-AC014. The only annual limit with an underlying basis for air quality is the NO_x limit. Trident submitted an amendment to the application stating that they do not want the annual emission limits for SO₂, PM-10, CO or VOC.

2.0 Permit Requirements

2.1 Certification and Information Request Requirements

18 AAC 50.200 specifies that an owner or operator must maintain records of, and report to the department information on, the nature and amount of emissions from the stationary source, if requested by the department to determine compliance with AS 46.03, AS 46.14, and 18 AAC 50.

18 AAC 50.205 requires any permit application, report, affirmation, or compliance certification to include the signature of a responsible official for the following the statement: “Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete.”

Both of these requirements are included in the permit under *General Recordkeeping, Reporting, and Certification*.

2.2 General Requirements for All Minor Permits

As described in 18 AAC 50.544(a), each minor permit issued under 18 AAC 50.542 must identify the stationary source, the project, the permittee, and contact information; and include

requirements to pay fees, conditions established under 18 AAC 50.201; and requirements of an Owner Requested Limits (ORL) under 18 AAC 50.225.

The permit cover page identifies the stationary source, the project, permittee, and contact information. The permit contains emission fee requirements. There are no conditions established under 18 AAC 50.201. There is no previously existing ORL under 18 AAC 50.225 that applies to the stationary source.

2.3 Requirements for Stationary Sources Not Subject to Title V Permitting Requirements

As described in 18 AAC 50.544(d), for a stationary source that is not subject to Title V permitting under 18 AAC 50.326, the department will include in the minor permit a requirement to periodically affirm whether the stationary source is still accurately described by the application and minor permit, and whether the owner or operator has made changes that would trigger a requirement for a new permit under 18 AAC 50.

2.4 Requirements for a Minor Permit that Revises or Rescinds a Previous Title I Permit

As described in 18 AAC 50.544(i), each minor permit under 18 AAC 50.508(6) must also include terms and conditions as necessary to ensure that the permittee will construct and operate the proposed stationary source or modification in accordance with 18 AAC 50. This includes the conditions of Construction Permit 9825-AC014.

In Construction Permit No. 9825-AC014, the permittee is subject to owner requested limits for PSD avoidance (NO_x), and for ambient air quality protection (PSD increment for short-term SO₂ and annual NO₂). These limits also limit PTE of any individual regulated air pollutant to less than 100 tpy. Therefore, the St. Paul Plant is not subject to Title V permitting requirements.

2.4.1 NO₂ Ambient Air Quality Requirements

For NO₂ increment protection, Permit No. 9825-AC014 limited Trident to “no more than a total of 160,974 gallons of distillate fuel in [Units] 1 and 2, no more than 86,401 gallons in [Units] 3 through 5, and no more than 288,576 gallons in [Units] 6 and 7 per year.” These fuel limits resulted in estimated maximum NO_x emission of 45 tpy in Units 1 and 2, 12.6 tpy in Units 3 through 5, and 2.9 tpy in Units 6 and 7, based on manufacturer emission factors.

In their March 2005 minor permit application, Trident requested to revise the fuel limits with emission limits. Trident has also requested to reinstate an authorization granted in expired Construction and Operating Permit No. 230TVP01 that allows Trident to burn more fuel in the smaller engines (Units 3 through 5). The department conducted modeling in 1999 that showed this reallocation of emissions did not result in a violation of NO₂ increments and standards. The memorandum describing the departments modeling analysis is included in Attachment B.

In Minor Permit No AQ0230MSS01, the department has revised the fuel limits to emission limits, and has reinstated the emission allocation allowed in Permit 230TVP01. Because there is no longer a Title V permit, this minor permit contains all necessary monitoring, recordkeeping and reporting to ensure compliance with the NO₂ ambient air quality limit. The minor permit requires Trident to track 12-month emissions on a monthly basis for Units 1 and 2, Units 1

through 5, and Units 6 and 7. They are required to (1) report permit deviations within 30 days of the end of the month that the deviation occurred, and (2) provide records to the department once a year.

The department included August 2002 source test NO_x emission factors in the monitoring conditions. Since the source test emission factors are lower on a pound per gallon basis than the manufacturer emission factors, Trident is able to combust more fuel than allowed under Permit No 9825-AC014.

2.4.2 SO₂ Ambient Air Quality Requirements

The short-term SO₂ ambient air quality protection conditions listed in Permit 9825-AC0014 are necessary in this minor permit to ensure continued compliance with 18 AAC 50. The short-term (3-hour and 24-hour) SO₂ ambient modeling demonstration for Permit No. 9825-AC014 was based the information shown in **Table 2**.

Table 2 – Assumptions Used in Modeling Short-Term SO₂ Ambient Impacts

Time Period	Fuel Consumption ^b	Fuel Sulfur	SO ₂ Emissions
3-hour	163.7 gph	0.24 wt% S	16.7 lb/3-hr
24-hour	105.7 gph	0.24 wt% S	86.5 lb/24-hr
3-hour	171.8 gph	0.24 wt% S	17.6 lb/3-hr
24-hour	100.2 gph	0.24 wt% S	82.0 lb/24-hr

For Permit No. 9825-AC014, the department found that **pound per unit time** limits would not be enforceable, so required Trident to monitor short-term fuel use on a **gallon per unit time** basis, using the following equation:

$$\frac{\text{gallon}}{\text{unit time}} = \frac{\text{lb SO}_2}{\text{unit time}} \times \frac{\text{lb S}}{2 \text{ lb SO}_2} \times \frac{100 \text{ lb fuel}}{(\text{wt\% S}) \text{ lb S}} \times \frac{\text{gallon}}{7.1 \text{ lb fuel}}$$

Using Trident's limits per three hours for the engines results in

$$\text{Engines: } \frac{\text{gallon}}{3 - \text{hours}} = \frac{16.7 \text{ lb SO}_2}{3 - \text{hours}} \times \frac{\text{lb S}}{2 \text{ lb SO}_2} \times \frac{100 \text{ lb fuel}}{(\text{wt\% S}) \text{ lb S}} \times \frac{\text{gallon}}{7.1 \text{ lb fuel}}$$

or

$$\text{Engines: } \frac{118}{(\text{wt\% S}) \text{ lb S}} \text{ gallons per 3 hours}$$

Similar calculations for the boilers 3-hour fuel-per-unit-time limit and engine and boiler 24-hour limits, respectively, result in

$$\text{Boilers: } \frac{124}{(\text{wt\% S}) \text{ lb S}} \text{ gallons per 3 hours}$$

Engines: $\frac{609}{(wt\%S)lb\ S} \text{ gallons per 24 hours}$

Boilers: $\frac{577}{(wt\%S)lb\ S} \text{ gallons per 24 hours}$

Note that monitoring method on a pound per unit time or a gallon per unit time does not limit Trident to operation of certain units in at any given time, as long as they stay below the given limit. In addition, the permit does not limit Trident to a maximum of 0.24 wt% S, instead the fuel sulfur content is included in the calculation, as follows:

These short-term fuel limits are necessary for short-term SO₂ increment protection only if the fuel sulfur content is greater than 0.24 wt%S. Also, because of the maximum fuel rates of each unit,⁵ Trident needs to monitor short-term fuel use only if they have the potential to meet or exceed the maximum fuel use shown in **Table 2**. They have the potential to exceed the three-hour maximum fuel use shown in **Table 2**:

- for the engines, if Unit 1 and at least three other generators are operating (this is the only way they could meet or exceed 163.7 gph); and
- for the boilers, if both Units 6 and 7 are operating (this is the only way they could meet or exceed 171.8 gph).

They have the potential to exceed the 24-hour maximum fuel use shown in **Table 2**:

- for the engines, if Unit 1 and at least one other generator are operating (this is the only way they could meet or exceed 105.7 gph);
- for the boilers, if Unit 6 is operating (alone or with Unit 7) (this is the only way they could meet or exceed 100.2 gph).

To minimize the short-term fuel monitoring requirements for Trident, these exclusions are included in the permit.

Because there is no longer a Title V permit, this minor permit contains all necessary monitoring, recordkeeping and reporting to ensure compliance with the SO₂ short term ambient air quality limits. They are required to report permit deviations and also to provide records to the department twice a year.

2.4.3 NO_x PSD Avoidance

This permit change will not result in any changes to NO_x PTE. Because there is no longer a Title V permit, this minor permit contains all necessary monitoring, recordkeeping and reporting to ensure compliance with the PSD avoidance limit. Emissions of SO₂, CO, PM-10, and VOC

⁵ Maximum fuel consumption for each unit :provided in Trident's March 2005 minor permit application is as follows: Unit 1 - 72.1 gph, Unit 2 - 35.3 gph, Unit 3 - 33.6, Unit 4 - 22.7 gph, Unit 5 - 9.8 gph, Unit 6 - 100 gph, and Unit 7 - 72 gph.

will increase slightly (no more than 10 tpy each) but the total for each will remain below the PSD major threshold of 250 tpy.

2.4.4 Stack Height and Fuel Meter Accuracy Requirements

The ambient air quality compliance demonstration for Permit No. 9825-AC014, as revised in the September 30, 1999 memorandum (included in Attachment B) is based on specific stack heights included in the demonstration, and on the assumption that there are no weather caps or other devices to obstruct vertical flow of exhaust. These requirements are still applicable and are included in the minor permit.

Similarly, Permit No. 9825-AC014 required use of flow meters with an accuracy of plus or minus five percent. This is still applicable, and the minor permit contains mr&r to ensure that Trident maintains flow meter accuracy.

2.4.5 Fish Oil Authorization

In their application, Trident requested that the department authorize Trident to use fish oil in the boilers. The department recognizes positive aspects of fish oil such as the reduction in environmental risk from transporting hydrocarbon fuel to St. Paul.

In this application, Trident has requested use of fish oil in the boilers, which emit a relatively small portion of the NO_x emissions at the St Paul Plant (2.9 out of 60.5 tons per year). Ambient air quality modeling⁶ for Seafood Processors on St Paul Island indicates that the maximum NO₂ increment impact of the processors is 20 µg/m³. Due to the small impact of the boiler, this provides a sufficient margin of compliance with the increment standard of 25 µg/m³.

The department therefore has no air quality control rationale to restrict or prohibit use of blended fuel oils in the boilers, and authorizes the use of fish oil and fish oil blended with fuel oil in the boilers at the St. Paul Plant.

2.4.6 Other Permit Conditions

The permit contains additional requirements as necessary to ensure that the permittee will construct and operate the proposed stationary source or modification in accordance with 18 AAC 50, as described in 18 AAC 50.544(i). These requirements are listed in the permit under *Generally Applicable Requirements* and *General Recordkeeping, Reporting, and Certification Requirements*.

3.0 Permit Administration

This minor permit revokes and replaces Title I Construction Permit No. 9825-AC014 dated January 25, 1999.

Trident may operate in accordance with Minor Permit AQ0230MSS01 upon issuance. As long as Trident maintains emissions below 100 tpy of each regulated air pollutant, they will avoid the need for a Title V permit.

⁶ Technical Analysis Report, St. Paul Island Seafood Processors, UniSea, Inc. Barge (9825-AC013), Trident Seafoods St. Paul Plant (9825-AC014), Icicle Seafood, P/V Arctic Star (ORL 000339), prepared by Carolyn Hudson and John Kuterbach, ADEC, November 12, 1998.

Attachment A
Detailed Permit History Pertaining to Construction/Operating Permit
No. 230TVP01

March 25, 1998	Trident submits amended title V operating permit application.
January 25, 1999	Construction Permit 9825-AC014 issued. This permit contains separate fuel quantity limits for Units 1 and 2 (larger generators), combined, and for 3 through 5 (smaller generators), combined, for NO _x ambient air quality protection – see condition 13.
April 16, 1999	Construction Permit 9825-AC014 reissued (same condition 13).
September 24, 1999	Public notice draft of Construction/Operating Permit No. 230TVP01. The department had found that fuel quantity limits listed in Construction Permit No. 9825-AC014 were not adequate to protect ambient air quality. The department revised fuel quantity limits to NO _x emission limits. Department obtained the NO _x emission limits from the ambient air quality dispersion modeling performed by Trident in January 1998. The department had to make this change as a construction permit authorization, this is the reason the department public noticed a construction/operating permit. Trident did not request this change and did not submit a construction permit application for this change.
September 30, 1999	Bill Walker conducted dispersion modeling to determine if engine fuel reallocation from smaller generators to larger generators would result in a violation of ambient air quality standard or increments. Concluded that this would be okay for ambient air quality (see Attachment B).
October 1, 1999	Email from John Stone (department) to Bob Cannone (department) indicating the Trident wants to operate small generators in excess of fuel limits but stay within stationary source cap. Indicated that Bill Walker had found this was okay for ambient air quality and asked Bob Cannone to prepare a COBC.
October 1, 1999	Email from John Kuterbach to John Stone and Bob Cannone. Indicated that construction/operating permit out for comment, and that the best way to handle would be as a comment on the construction/operating permit.
October 29, 1999	Tridents comments on proposed construction/operating permit. Comments included objection to NO _x emission limit (rather than fuel limit) and also requested a cumulative equivalent total (CET) fuel limit. (Department response to comment is dated March 10, 2000.)
November 12, 1999	Letter from Doug Donegan (Trident) to John Stone containing written request to reallocate fuel. (The department processed as an emission

- reallocation for ambient air quality protection). Department used this approach because it was quicker than construction permitting process.
- March 10, 2000 Department Response to Comment on proposed construction/operating permit. Regarding Trident's objection of emission limit, the department cited authority to establish emission limits under 18 AAC 50.315(e)(2) to ensure compliance with ambient air quality standards and increments. The department found that the fuel quantity limits were not adequate to protect ambient air quality. Regarding CET, the department found Trident's October proposal inadequate to protect ambient air quality, and established emission limits for 1 and 2 (larger generators), combined; and for 1 through 5 (all generators), combined. This allowed Trident to combust more fuel in the smaller generators if they wanted.
- March 31, 2000 Department issued Construction/Operating Permit No. 220TVP01.

Attachment B
September 13, 1999 Modeling Memorandum

MEMORANDUM

State of Alaska

Department of Environmental Conservation
Division of Air & Water Quality
Air Permits Program

TO: John M. Stone, Manager
Air Permits Program

DATE: September 30, 1999

FILE: Trident St. Paul Construc. Permit File

THRU:

TELEPHONE NO: 465-5100; FAX: 465-5129

FROM: Bill Walker, Envir. Eng. Assoc.

SUBJECT: St. Paul Modeling

The objective of this project is to find out if impacts will exceed the NO₂ increment if Trident St. Paul uses their smaller engines with poorer dispersion characteristics for a larger portion of their power. They are currently operating under separate fuel restrictions for two groups of engines.

CONCLUSIONS

Based on modeling results, I conclude that reallocating the fuel distribution to burn more in the engine groups with the shorter stacks (D379 and D3406B) and less in the other group (D3512 and D3412) will decrease ambient impacts, and will not result in a violation of the standards or increments.

Trident can burn from 86,401 gallons up to the entire fuel allocation for all of the diesel engines-- 247,375 gallons per year--in the D379 and D3406B, instead of part in the larger engines, and not violate the NO₂ standard or increment.

Other fuel allocation plans may be approvable, but the above reflects the scope of my modeling.

This modeling does not analyze any change to permit terms to protect-short term standards or increments. I assumed that the applicant's request does not affect what engines can run simultaneously.

MODELING PROCEUDRES

I used the modeling files Alan provided me, and ran them with 3 scenarios. For each scenario there are two receptor grids in the existing input files, and two meteorological data years. I did not examine any of the existing input files for accuracy, as I am told that Alan and Tom Casey have already done that.

Scenario 1. I assumed that all of the fuel allowed for all engines was burned by the engine group with the shorter stacks. Within that group, I assumed that all of the fuel was burned by the engine that gives the most NO_x for the amount of power produced or fuel consumed. (That one engine is capable of burning all of the allowable fuel for the facility.) This scenario gave a smaller amount of NO_x produced per amount of fuel consumed than the existing fuel distribution, but presumably the dispersion is less because of the stack parameters.

Scenario 2. I re-ran the existing modeling files without change (other than file pathways) for comparison to Scenario 1. This Scenario is the basis for current permit conditions.

Scenario 3. Scenarios 1 and 2 included negative emission sources to subtract the contributions of baseline sources, which no longer exist. This allows comparison to the increment rather than the standard. Concentrations at some receptors were as low as minus 729 ug/m³. To find out if there would be standards violations, I deleted all of the negative emission sources from Scenario 1 to use for Scenario 3.

The impacts are NO₂ rather than NO_x, because I used a version of ISC that has a built-in option to use the ozone limiting method. This is the same version of ISC that was used for the original modeling.

I did not model SO₂ emissions. I assumed that the request from Trident does not change what engines are allowed to operate at the same time on a short-term basis.

RESULTS

For Scenario 1 the maximum NO₂ impact at any receptor was 17.5 ug/m³.

For Scenario 2 the maximum NO₂ impact was 19.6 ug/m³.

Therefore, the requested change causes the ambient impacts to go down, and increments will not be violated.

The highest concentration for Scenario 3 was 18.6 ug/m³. Therefore, there is no standard violation predicted for the requested change. I considered running a 4th scenario to delete the negative emissions from Scenario 2. But presumably this has already been looked at, and the small difference between Scenarios 1 and 2 indicate that doing Scenario 4 would not show anything near a standard violation.

BW/pal (g:\awq\awq-permits\airfacs\trident st. paul\construct\x53\fuel realloc mem1999.doc)

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